

Amendments to the Claims:

Please amend claims 1, 16, 21, 23, 35, 43, and 45 as follows. Claims 19, 20, and 22 have been cancelled. This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

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1. (Currently amended) A working end of an electrosurgical probe for delivering energy to tissue,
a tissue-engaging surface for engaging tissue and delivering energy to tissue;
a variable electrical resistive body comprising a solid material, the variable electrical resistive body extending inward at an interior of said tissue-engaging surface; and
wherein the body provides low resistance electrical current paths between from an interior conductor portion of the body and [[to]] said tissue-engaging surface when the body is at a first temperature, the low resistance electrical current paths allowing the interior conductor portion to cause ohmic heating of the tissue, and wherein the body displays increased resistance electrical current paths between from said interior conductor [[to]] said tissue-engaging surface when the body is at a selected higher temperature.
2. (Previously Presented) The working end of claim 1 further comprising an electrical source operatively coupled to said interior conductor portion of the body.
3. (Previously Presented) The working end of claim 1 wherein said tissue-engaging surface is at least partly a thin-film electrically conductive material.
4. (Previously Presented) The working end of claim 1 wherein the body comprises an electrically nonconductive material doped with an electrically conductive doping composition distributed therein to provide a positive temperature coefficient body wherein the electrical resistance of the body increases with an increase in temperature of the body.

5. (Previously Presented) The working end of claim 1 wherein the body comprises an electrically nonconductive material doped with an electrically conductive doping composition distributed therein to provide a negative temperature coefficient body wherein the electrical resistance of the body decreases with an increase in temperature of the body.

6. (Previously Presented) The working end of claim 4 wherein electrically conductive doping composition comprises carbon particles.

7. (Previously Presented) The working end of claim 1 wherein said selected higher temperature ranges between about 40°C. and 200°C.

8. (Previously Presented) The working end of claim 1 wherein the body is a ceramic material with an electrically conductive doping composition distributed therein.

9. (Previously Presented) The working end of claim 1 wherein the body is a resilient material with an electrically conductive doping composition distributed therein.

10. (Previously Presented) The working end of claim 1 wherein the body is of a compressible material with an electrically conductive doping composition distributed therein.

11. (Previously Presented) The working end of claim 10 wherein the body comprises a silicone polymer doped with a conductive composition.

12. (Previously Presented) The working end of claim 10 wherein the body varies in electrical resistance in response to pressure applied thereto.

13. (Previously Presented) The working end of claim 1 wherein the body carries a thin-film metallic coating.

14. (Previously Presented) The working end of claim 13 wherein said thin-film metallic coating extends 360° about the tissue-engaging surface of a needle-like working end.

15. (Previously Presented) The working end of claim 14 wherein said thin-film metallic coating extends about only a portion of the working end.

16. (Currently Amended) A method for controlled application of energy to a targeted tissue, comprising the steps of:

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providing a probe with a working end of a variable electrical resistive body comprising a solid material, the variable electrical resistive body having a tissue-engaging surface, and at least one interior conductor coupled to a voltage source, wherein the body provides low resistance electrical current paths between ~~from~~ said at least one interior conductor and ~~[[to]]~~ said tissue-engaging surface when the body is at a first temperature, and wherein the body displays increased resistance electrical current paths ~~from~~ between said at least one interior conductor and ~~[[to]]~~ said tissue-engaging surface when the body is at a selected higher temperature;

positioning said tissue-engaging surface in contact with the targeted tissue; and
delivering RF energy to said at least one interior conductor thereby causing ohmic heating in said tissue wherein energy application to said tissue through said tissue-engaging surface is modulated by changes in resistance of said variable electrical resistive body in response to temperature changes therein.

17. (Previously Presented) The method of claim 16 wherein the variable electrical resistive body defines a switching range in which its electrical resistance increases to terminate current flow through local portions thereof at a pre-selected temperature, and the delivering step comprises the step terminating RF heating of tissue in any time interval that said variable electrical resistive body is at or above said switching range.

18. (Previously Presented) The method of claim 16 further comprising the step of applying energy to the targeted tissue by means of conduction of heat through the tissue-engaging surface from said variable electrical resistive body.

19. - 20. (Canceled)

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21. (Currently amended) A surgical probe for delivering energy to tissue, comprising:
an elongated probe having a working end body with a tissue-engaging surface for contacting tissue;
the body comprising an electrically non-conductive, solid material doped with an electrically conductive doping composition distributed therein to provide variable resistance to electrical current flow therethrough, wherein the body provides a multiplicity of low resistance electrical current paths therethrough at a first temperature,
and wherein the body provides increased resistance electrical current paths therethrough when the body is at a pre-selected higher temperature; ~~and~~
an interior electrode having a first polarity carried in the interior of said body, said interior electrode operatively connected to a voltage source; and
wherein the low resistance electrical current paths allow the interior electrode to cause ohmic heating of the tissue.

22. (Canceled)

23. (Currently Amended) The working end of claim 21 wherein first and second polarity electrodes are spaced apart by an intermediate body of an electrically non-conductive material doped with an electrically conductive doping composition distributed therein to provide variable resistance to electrical current flow therethrough.

24. (Previously Presented) The working end of surgical probe of claim 21 wherein said body of an electrically non-conductive material doped with an electrically conductive doping composition distributed therein is selected from the class of materials consisting of positive temperature coefficient materials and negative temperature coefficient materials.

25. (Previously Presented) The working end of claim 21 wherein said body is a conductively doped foam.

26. (Previously Presented) The working end of claim 22 wherein said body is a conductively doped silicone.

27. (Previously Presented) The working end of claim 26 wherein said conductively doped silicone has an open cell structure.

28. (Previously Presented) The working end of claim 21 wherein said body is a conductively doped zirconium oxide.

29. (Previously Presented) The working end of claim 21 wherein said body defines a gradient of electrical resistance across the tissue-engaging surface.

30. (Previously Presented) The surgical probe of claim 21 wherein the working end body has a linear configuration.

31. (Previously Presented) The surgical probe of claim 21 wherein the working end body defines at least one radius of curvature.

32. (Previously Presented) The surgical probe of claim 21 wherein the working end body has a helical configuration.

33. (Original) The surgical probe of claim 21 further comprising an independent cutting electrode at a distal tip of the working end.

34. (Previously Presented) The working end of claim 27 further comprising a fluid source coupled to said open cell material for delivering fluid thereto.

35. (Currently Amended) A surgical probe for delivering energy to tissue, comprising:

an elongated probe having a working end body with a tissue-engaging surface for contacting tissue;

an outer portion of the body comprising a solid material having a resistance to electrical flow therethrough that varies substantially with pressure applied thereto; and

an electrical conductor carried at an interior of the probe that is operatively connected to a voltage source, wherein the electrical conductor causes current flow for ohmic heating of the tissue.

36. (Previously Presented) The working end of claim 35 further comprising an intermediate body portion intermediate the outer portion and the electrical conductor, the intermediate body portion of a material having a resistance to electrical flow therethrough that varies substantially with temperature.

37. (Previously Presented) The working end of claim 35 wherein said outer portion of the body has a resistance to electrical flow therethrough that decreases with pressure applied thereto.

38. (Previously Presented) The working end of claim 35 wherein said outer portion of the body has a resistance to electrical flow therethrough that increases with pressure applied thereto.

39. (Previously Presented) The working end of claim 35 wherein said outer portion of the body is an open cell sponge-type material.

40. (Previously Presented) The working end of claim 39 further comprising a fluid source coupled to said open cell sponge-type material for providing fluid flow thereto.

41. (Previously Presented) The working end of claim 35 wherein said outer portion of the body is a closed cell sponge-type material.

42. (Previously Presented) The working end of claim 35 further comprising a thin film conductive layer carried about an exterior portion of said working end.

43. (Currently Amended) A surgical probe for delivering energy to tissue, comprising:

a probe body having a working end with a tissue-engaging surface for

contacting tissue;
a first body portion inward of said tissue-engaging surface comprising a solid positive temperature coefficient material having an electrical resistance that increases substantially at a pre-selected temperature;
a second body portion comprising a material that that is a resistive heating element; and
at least one electrical conductor at the interior of the body operatively connected to a voltage source, wherein the at least one electrical conductor causes current flow to ohmically heat the tissue.

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44. (Previously Presented) The working end of claim 43 wherein said second body portion and said at least one electrical conductor are operatively connected in series to a voltage source.

45. (Currently Amended) A surgical probe for delivering energy to tissue, comprising:
an elongated probe having a working end with a tissue-engaging surface for contacting tissue;
a body portion extending inward of said tissue-engaging surface comprising a solid material that comprises a variable electrical resistive body;
means for varying the resistance of said body portion; and
at least one electrode carried at ~~the interior of the~~ working end operatively connected to a voltage source, wherein the at least one electrode causes current flow to ohmically heat tissue.

46. (Previously Presented) The working end of claim 45 wherein said means for varying the resistance of said variable electrical resistive body is selected from the class consisting of direct current energy application means and photonic energy application means.

47. (Previously Presented) A method for controlled application of energy to a targeted tissue, comprising the steps of:

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providing a probe with a working end comprising a resilient surface layer of a variable electrical resistive material and an interior conductor coupled to a voltage source, wherein the resilient surface layer provides low electrical conductivity therethrough from the interior conductor to a tissue-engaging exterior of the resilient surface layer, and wherein resilient surface layer provides high electrical conductivity therethrough from the interior conductor to said tissue-engaging exterior when the resilient layer is compressed;

placing said tissue-engaging surface in contact with the targeted tissue; and

delivering RF energy to the interior conductor thereby causing ohmic heating in the targeted tissue wherein energy application through the resilient surface layer is modulated by changes in resistance of said resilient layer in response to pressure of the resilient layer against the targeted tissue.

48. (Previously Presented) An electrosurgical probe for delivering energy to tissue comprising a probe with a handle end and a working end, the working end carrying an interior electrical conductor covered with a surface layer of a pressure variable resistor ink.